

## THE COCCIDAE OF SOUTH AFRICA --IV.\*

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(PLATES V--XII.)

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147. ***Chionaspis scutiae***, sp. n. (Plate v, fig 176).

Scale of adult ♀ about 2 mm. long, moderately broadened behind, convex, usually curved, white, not glossy, but with ± conspicuous growth-lines; exuviae orange-brown to dark brown. The colour of the second exuviae is only slightly obscured by a faint secretory covering.

Puparium of ♂ comparatively large, white, non-carinate, with yellow or orange exuviae.

Adult ♀, when mounted, regular in outline, about 1.3 mm. long, elongate, widest behind the middle, hyaline, except the median lobes which are very dense, and the middle part of the pygidium which is yellowish. The segmentation of the body is unusually distinct but is not strongly marked at the margins, nor are the abdominal segments produced.

The pygidial margin is simple. There is only one pair of lobes present, which are short and broad, densely chitinised, brown, with the rounded outer margin once notched. Plates are apparently absent, but there are two stout spines on each side. Pygidium as illustrated (fig. 176). Circumgenital glands in 5 groups :

2—4  
9—12 9—12  
14—22 14—22

*Habitat*: "Wacht-een-beetje" (*Scutia indica*, Brohn), Naauwpoort, C.P.; collected by C. P. Lounsbury, September 1907.

*Collection No.*: 182.

\*For Part II, see Bull. Ent. Res. ix, p. 107; Part III, Bull. Ent. Res. ix, p. 197.  
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148. **Chionaspis (Pinnaspis) chionaspitiformis** (Newst.) (Plate v, fig. 175).

?*Diaspis chionaspiformis*, Newst., Bull. Ent. Res. i, p. 198, 1910.

*Hemichionaspis chionaspitiformis*, Lindinger, Jahrb. Hamb. Wiss. Anst. xxvii, Beih. 3, 1910.

Scale of adult ♀ about 2 mm. long, white, appearing very loosely constructed and soft in texture, moderately broadened behind, with yellowish or brownish exuviae. The second exuviae are covered with a thin layer of secretion.

Puparium of ♂ elongate, non-carinate, with yellow exuviae.

Some specimens collected by Claude Fuller on twigs of a native tree at Busi, Portuguese East Africa, appear as matted, dark brown to blackish scales, with brown exuviae. This, I think, is due to an accumulation of sooty fungus, as the insects agree in all other respects with those on African mahogany from Rhodesia.

Adult ♀ mounted, about 1.4 mm. long and 0.7 mm. broad at the widest point, which is situated at a considerable distance beyond the middle. The insect is narrow, rounded in front, gradually broadening to the free abdominal segments, from which it suddenly narrows to the hind extremity, which is pointed. The whole body is hyaline except the mouth-parts and median portion of the pygidium, which are yellow. The median lobes are densely chitinised and brown. The antennal tubercles are rather large with one very long flagellum and a few short spurs. Parastigmatic glands present, 5 to 8 at each anterior spiracle.

The pygidium is characterized by a single pair of lobes, which are broader than long and have their inner margins in close contact or fused; their distal end is evenly rounded and the outer margin deeply notched. From the outer edge of each lobe a short spine arises. The plates are longer and more curved than in *C. cassiae*—as illustrated in fig. 175. Circumgenital glands in 5 groups, as in *cassiae*, or with the posterior lateral glands slightly more numerous.

The most striking differences between this species and *C. cassiae* are:—that the scale is white, without the transverse brownish ridges, and the pygidium appears more acute, with the plates longer and more curved.

*Habitat*: On African mahogany, Zomba, Nyasaland; collected by Ross-Townsend, December 1908 (Cape Collection 2100). On native tree, Busi, Portuguese East Africa; collected by C. Fuller, May 1915.

*Collection No.*: 322, 322a.

149. **Chionaspis simplex**, Green, var. (Plate vi, fig. 178).

*Chionaspis simplex*, Green, Cocc. Ceylon, ii, p. 160, 1899.

Scale of adult ♀ large, 3 mm. long, and 1.5 mm. broad, broadest about middle, white, dull, without distinct growth-lines. First exuviae colourless to yellowish; second exuviae large, roundly convex, glassy, usually ± buff in colour, with a depressed median area bordered on each side by a prominent beaded ridge. In living material the second exuviae are apparently covered by a thin, dull white layer of secretion, which is easily flaked off. In the majority of dry specimens this layer and the first exuviae are missing.

Puparium of ♂ not observed.

Adult ♀♀ contain many well developed embryos with 5-jointed antennae.

Adult ♀, when mounted, elongate, narrowly rounded in front, broadest immediately behind the middle, and somewhat broadly pointed behind, hyaline, with the pygidium slightly denser; abdominal segments well marked and flatly rounded at the margin. Pygidium without lobes or plates, coarsely corrugate, with conspicuous spines and dorsal glands as illustrated (fig. 178). Circumgenital glands in 5 groups, which are often almost contiguous in a wide bow:

18—25  
24—32 24—32  
48—60 48—60

*Remarks.*—This species is very much like *C. simplex* Green, and is in all probability the variety he mentions from Mauritius; it has but 5 groups of circumgenital glands instead of 7 as in *C. simplex*.

*Habitat*: On bamboo, Durban, Natal; collected by A. Kelly, May 1915.

*Collection No.*: 175.

150. **Chionaspis caffra**, sp. n. (Plate v, fig. 174).

Scale of adult ♀ about 2 mm. long, narrow, but gradually widening to near the posterior end, where it is flattened and broadly rounded, straight or slightly curved. Exuviae brown; second exuviae covered.

♂ puparium small, white, with orange exuviae; generally non-carinate, sometimes faintly tri-carinate.

Adult ♀, mounted, about 1.4 mm. long, narrow in front, then gradually widening to some distance behind the middle; anterior part of body and median parts of the anterior abdominal segments considerably chitinised; abdominal segments not rounded, nor produced at the margin. Antennal tubercles small, each with one very stout spine. L<sub>1</sub> close together, inner margin slanting slightly outward, crenulate. L<sub>2</sub> small, roundly conical. Circumgenital glands in 5 groups:

5—7  
8—14 8—14  
19—25 19—25

*Habitat*: On *Acacia* sp., probably *A. caffra*, The Thorns, Pretoria; collected by C. P. Lounsbury, September 1915.

*Collection No.*: 150.

151. **Chionaspis ambiguus**, sp. n. (Plate v, fig. 177).

Scale of adult ♀ elongate, mytilaspiform, narrow in front, broadly rounded behind, usually ± curved, arched, 2.3 mm. long, somewhat covered by outer bark tissues. Colour of scale pale to dark brown, with a greyish surface covering; exuviae yellow.

♂ puparium not observed.

Body of adult ♀ elongate, broadest just behind middle, anterior end tapering slightly and broadly rounded in front, posterior end tapering abruptly to the two densely chitinous median lobes. These, together with the chitinous thickenings extending into the pygidium, and the mouth-parts, are yellowish; remainder of body hyaline. Free abdominal segments (4) slightly rounded, not much produced. Antennal tubercles moderately large, with two stout spines. Parastigmatic glands 0.

Pygidium (fig. 177) with one pair of lobes, which are close together on their inner surface, their outer edges being crenulate. Between the median lobes there are two large spines but no plates. At the outer margins there is also a large spine, then a gland from which arises a small sharply pointed plate, then a very small rudimentary lobe, which is pointed and chitinous and in some cases seems to be composed of two lobules of which the outer is the smaller. These are followed by a long simple dagger-shaped plate, then a large gland opening and another plate. Beyond this the margin appears thickened like a minute rudimentary lobe, beyond which there are two additional pairs of plates. There are a few plates on the margin of the first abdominal segment from the pygidium in addition to the glands. Extending into the pygidium are three pairs of chitinous thickenings. Circumgenital glands in 5 groups, of which the median and anterior laterals are often almost united into a bow.

7—11  
10—14 10—14  
6— 9 6— 9

*Remarks.* A large percentage of the ♀ scales showed the circular exit holes of some Hymenopterous parasite.

*Habitat* : On twigs of lilac, Fort Beaufort, C.P.; collected by C.P. Lounsbury, June 1913.

*Collection No.* : 263.

152. **Chionaspis leucadendri**, sp. n. (Plate v, figs. 166, 171).

Scale of adult ♀ about 2·6 mm. long, white, smooth, slightly glossy, not very convex, long and narrow, somewhat widened and flattened behind. Exuviae brownish; second exuviae covered by a very thin layer of secretion.

♀ scales chiefly on stems; ♂ puparia most common on leaves.

♂ puparium comparatively large, white, flat, slightly roughened, not carinated, with pale exuviae, which are sometimes ± greenish yellow in colour.

Adult ♀, mounted, about 1·4 mm. long, narrow in front, but quickly widening to about middle, whence it gradually narrows again to the median lobes. Abdominal segments well indicated but not prominently produced. Body moderately chitinised, the mouth-parts, lobes, and margin of pygidium denser. The four abdominal segments adjoining the pygidium have their margins with a few gland-pores and a number of short, stout, very acute spine-glands. These, seen in optical section, appear like rose-spines, but the points are often long, slender and curved. They occur chiefly on the margin, but extend in scattered formation some distance within the edge.

P<sub>1</sub> small, spine-like. L<sub>1</sub> rounded, striate, arising from the thickened margin of the pygidium. P<sub>2</sub>-6 long, dagger-shaped. Circumgenital glands in 5 groups, which are almost contiguous, in the form of a horse-shoe :

4—7  
11—18 11—18  
26—32 26—32

*Habitat* : On silver-leaf tree (*Leucadendron argenteum*), National Botanic Gardens, Kirstenbosch, Capetown; collected by the late Professor H. H. W. Pearson, August 1914.

*Collection No.* : 145.

153. **Chionaspis (Phenacopsis) lounsburyi**, Cooley (Plate v, fig. 169).

*Chionaspis lounsburyi*, Cooley, Can. Ent. xx, p. 87, 1898.

*Phenacaspis lounsburyi*, Fernald, Catalogue, p. 238, 1903.

Adult ♀ scale about 3 mm. long, white, glossy and pearly, sides almost parallel when at the margin of a leaf, but usually broadened behind the middle when on the blade; evenly rounded behind, often with faint transverse ridges. Ventral scale absent or represented only by the incurved margins of the dorsal scale and an extremely delicate layer which remains on the leaf. Exuviae orange-yellow or orange-brown; first exuviae paler, second covered by a pearly white layer of secretion.

♂ puparium about 1 mm. long, similar to that of ♀ but smaller, non-carinated.

Body of the adult ♀ elongate, all colourless and hyaline, except the mouth-parts and lobes which are faintly yellow. The free abdominal segments are not produced at the margin, but are slightly rounded.

L<sub>1</sub> low, broad, and very widely divergent, usually appearing as though they projected from behind the thickened median area of the pygidium. L<sub>2</sub> composed of two small lobules which are distinctly separated; the inner lobule is the larger. Lobes distinctly striate. Plates simple, thin.

The antennae are placed a long way back near the mouth-parts and consist of minute tubercles each with one long thin curved hair. Parastigmatic glands present, usually 3 to 5 at anterior spiracles. Circumgenital glands in 5 groups:

4—7	
11—15	11—15
20—26	20—26

*Habitat*: On *Rhus thunbergi*, Ceres, C.P.; collected by C. P. Lounsbury, 1896. On a native Proteaceous plant, Wolseley, C.P.; collected by C. P. Lounsbury, June 1915.

*Collection Nos.*: 166, 170.

153a. **Chionaspis (Phenacopsis) lounsburyi ekebergiae**, var. n. (Plate v, fig. 168).

♀ scale similar to that of *C. lounsburyi*, but readily distinguished by the following characters:—

Parastigmatic glands present, 5 or 6 glands in a close crescent. Pygidial margin as figured (fig. 168). Circumgenital glands more numerous, e.g.,

6—9	
11—20	11—20
29—46	29—46

Plates more distinct and last row of dorsal glands more numerous than in *C. lounsburyi*, usually 9:4.

*Habitat*: On *Ekebergia* sp., Durban; collected by C. Fuller, July 1915.

*Collection No.*: B. 186.

154. **Chionaspis (Phenacaspis) natalensis**, Ckll. (Plate v, fig. 165).

*Phenacaspis natalensis*, Ckll., Ann. Mag. N.H. (7) ix, p, 25, 1902.

*Phenacaspis natalensis*, Fernald, Catalogue, p. 238, 1903.

Professor Cockerell's description is as follows :—

“ ♀ scale white, about 3 mm. long, pyriform ; exuviae pale orange-brown.

“ Five groups of circumgenital glands ; median of 10, anterior laterals 22–26, posterior laterals 19–26. Anal and genital apertures opposite. Median lobes large, widely diverging, broader than long, the long inner margin strongly serrulate ; their bases well apart, the space occupied by the usual pair of short spines. Second lobe represented by three elongated and rounded lobules, the first of which is largest and bears a spine. Third lobe represented by a very long narrow lobule bearing a spine followed by a broad and much shorter lobule, and then a very broad serrulate lobule, having its outer slope much the longest. The fourth lobe is represented by a triangular lobule bearing a spine and two slight swellings of the margin, too slight to be called lobules.

“ ♀ scale feebly tricarinate or barely keeled at all.”

*Habitat*: On mango, Durban, Natal ; collected by C. Fuller, 1901. On palm, Durban ; collected by A. Kelly, July 1915.

*Collection Nos.* : 171, 171a.

155. **Chionaspis (Dinaspis) imbricata**, sp.n. (Plate vi, fig. 179).

In material seen by the writer the scales invariably occupy cracks in the bark on the stems of the host-plant.

Scale of adult ♀ small, elongate, almost parallel-sided, white, with orange to brown exuviae.

Puparium of ♂ similar but smaller.

Adult ♀, when cleared and mounted, small, averaging 0·75 mm. long and 0·48 mm. broad. The anterior end is broadly rounded ; the sides of the body are almost parallel to a little more than half the length, when they gradually taper to the pointed pygidium. The anterior half of the body and the pygidial area are more densely chitinised than are the free abdominal segments and appear yellowish. The chitin on these parts is thickened in minute ridges, giving the impression of a finger-print, a character only found in a few Coccids.

It is impossible to describe the pygidial margin as having definite lobes, and plates are absent. The chitin is here folded so as to form numerous rounded more or less imbricated prominences, some of which reach, or extend beyond, the margin, which thus appears festooned. There are a few spines of moderate length at intervals around the margin. The anal opening is set well back from the margin and around it are a number of conspicuous thin spots in the chitin, appearing as perforations. In the second stage ♀ there are about three simple plates on each side of the pygidium.

Antennae set well forward, tubercles moderately prominent with one or two curved setae. Parastigmatic glands O. Circumgenital glands O.

*Habitat* : On stems of *Euclea natalensis*, Point Road, Durban ; collected by C. P. v. d. Merwe, July 1916.

*Collection No.* : 157.

156. **Chionaspis (Dinaspis) diosmae**, sp. n. (Plate v, fig. 167).

Insects  $\pm$  clustered on leaves of host-plant, especially on the upper surface.

Adult ♀ scale about 2.2 mm. long, comparatively broad, moderately convex, silky in appearance, with conspicuous growth lines. First exuviae yellow; second exuviae brownish, covered by a dense layer of secretion similar to remainder of scale. The layer covering the second exuviae is very easily removed and carries the small first exuviae with it. Owing to this fact many of the specimens appear to have brownish, shining pellicles.

Adult ♀ viviparous; mounted specimens contain many well-developed larvae.

Adult ♀, mounted, about 1.6 mm. long and 0.8 mm. broad; widest about middle and narrowing to each end. Body moderately chitinised. The pygidial margin is quite different from that of any other species of *Dinaspis* known to me. The median notch is angular, with narrow straight thickened margins, below which the median lobes project. Owing to this fact the appearance of the lobes varies greatly according to how the specimens are mounted,  $L_1$  in some cases appearing quite distinctly, in others being almost invisible. There are apparently no plates. Pygidium as illustrated (fig. 167). Circumgenital glands O.

*Habitat*: On buchu (*Diosma crenata*), Wellington, C. P.; collected by C. P. v. d. Merwe, November 1904 (Cape No. : 1554).

*Collection No.* : 147.

157. **Chionaspis (Dinaspis) lounsburyi** (Leonardi) (Plate v, fig. 172).

*Dinaspis lounsburyi*, Leon., Bol. R. Sc. Agr. Portici, p. 216, 1914.

*Chionaspis capensis*, Newst., Bull. Ent. Res. vii, p. 378, 1917.

Scale of adult ♀ about 2mm. long, elongate, generally straight, but varying in shape according to the position on the plant, condition of crowding, etc. On straight stems the sides of the scale are  $\pm$  parallel from the end of the second exuviae to beyond the middle, where it becomes slightly broadened with the hind margin broadly rounded. Other specimens situated in the angles of thorns, etc., are much shorter and broader, sometimes almost as broad as long. Colour of scale white; first exuviae bronze to bronze-brown; second exuviae brown, slightly pointed behind.

Puparium of ♂ about 0.8 mm. long, white, non-carinated, with orange pellicles. Posterior margin of puparium broadly rounded, opening by the upper part splitting from the lower so that the dorsal flap is exactly like the lower one.

Adult ♀ viviparous; when mounted, elongate. Anterior part suddenly narrowed and rounded in front, paler yellow; median portion of body darker yellow, wider, with almost parallel sides; posterior extremity broadly rounded. The free abdominal segments are broadly rounded at the margins. Antennal tubercle small, with two setae of medium length and thickness. Pygidium as illustrated (fig. 172). Circumgenital glands O.

*Habitat*: On stems and leaves of native spiny plant (*Gymnospora buxifolia*); extremely common around Pretoria and also received from Umtali, Rhodesia (sent by R. Lowe Thompson, of Salisbury).

*Collection No.* : 251.

158. **Chionaspis (Dinaspis) distincta** (Leonardi) (Plate v, fig. 170).

*Dinaspis distincta*, Leonardi, Bol. Sc. R. Agr. Portici, p. 213, fig. 33, 1914.

*Chionaspis distorta*, Newst., Bull. Ent. Res. vii, p. 377, 1917.

Scale of adult ♀ about 2·2 mm. long, moderately broad, convex and roughened, dull white or greyish white in colour, with exuviae dark orange-brown; second exuviae covered.

Puparium of ♂ robust, buff-coloured and non-carinate, with yellowish or orange exuviae. Very few ♂ specimens are present in the large amount of material before me and in a number of cases the ♂ puparium does not lie close to the stem in the usual manner, but seems to be attached at the anterior end and projects outward between several female scales.

Adult ♀ viviparous; elongate, narrow in front, gradually broadening to behind the middle, to which point the body is highly chitinised; posterior to this it is thin, hyaline. There are three pairs of lobes, which are more heavily chitinised than the remainder of the pygidium: L<sub>1</sub> broad, inner margins converging at the base, faintly trilobed or broadly crenulate; median lobe small, L<sub>2</sub> and L<sub>3</sub> small, ± triangular. Antennae with one long flagellum and four short stout spurs. Circumgenital glands O.

*Habitat*: On stems of *Protea hirta*, Pretoria; collected by the writer, October 1914. Professor Newstead's reference "Windersboom, Transvaal," should be Wonderboom, Pretoria.

*Collection No.*: 163.

159. **Chionaspis (Poliaspis) carissae** (Ckll.) (Plate v, fig. 164).

*Poliaspis carissae*, Ckll., The Entom. xxxv, p. 112, 1902; Fernald, Catalogue, p. 243, 1903.

Scale of adult ♀ about 1·8 to 2 mm. long, usually straight, widest shortly behind the second exuviae and somewhat abruptly narrowed and attenuated posteriorly; white, glossy, with brown exuviae.

Puparium of ♂ white, very long, distinctly tri-carinate; exuviae almost colourless.

Specimens on "umkavoti" at Durban had the ♀ scales faintly marked by transverse ridges and the ♂ puparia with a pronounced median ridge.

The body of the adult ♀ is long, narrow in front, then almost parallel-sided to the free abdominal segments, with the posterior margin regularly and broadly rounded. The median portion of the body is highly chitinised and appears brownish-yellow in mounted specimens. The anterior end is paler in colour, and the free abdominal segments and the pygidium are almost colourless. Circumgenital glands in 8 groups:

3—4	3—4	3—4
11—17	2—4	11—17
17—27		17—27

*Remarks.* Professor Cockerell's original description is as follows:—

"♀ scale similar to that of *P. cycadis*, but perhaps narrower. Second skin paler, as in *cycadis*.

"♀ similar to *P. cycadis*, but the strongly serrulate reddish-brown median lobes are wide apart, the interval being nearly as great as the breadth of a lobe; the second lobe consists of two lobules, of which the inner is the larger, and its tip projects a little



beyond the level of the tips of the median lobes ; the margin just beyond the second lobe bears two large dorsal glands, like those of the series on the next segments anteriorly ; there are only four dorsal glands in the short rows nearest the anal orifice. The middle of the body is red-brown, and strongly chitinised. Circumgenital glands in eight groups ; the posterior laterals 19, middle laterals (cephalolaterals of other genera) 11, median 5, in a transverse row, and the anterior groups characteristic of *Poliaspis* form a transverse series broken into three linear groups of three or four, which are widely separated.

“ ♂ scale tricarinate.

“ On *Carissa* (? *C. grandiflora*, D.C.) plant, which belongs to the Apocynaceae, Durban, Natal (Fuller). In these species and *P. cycadis* the anterior group of glands are in transverse lines ; in *P. media*, and the species described by Fuller from Australia, the groups are circular.”

*Habitat* : On *Carissa grandiflora* (amatingula), Durban ; collected by C. Fuller (part of original material). On “umkavoti” (*Chaetachme aristata*), Durban ; collected by C. Fuller, October 1914.

*Collection Nos.* : 181 and 167.

160. **Chionaspis (Pinnaspis) cyanogena** (Ckll.) (Plate vi, fig. 180).

*Hemichionaspis cyanogena*, Ckll., The Entom. xxxiv, p. 226, 1901 ; Fernald, Catalogue, p. 240, 1903.

Scale of adult ♀ about 2 mm. long, narrow, moderately convex, white, but appearing slightly greyish in massed specimens. Exuviae pale yellow to orange ; second exuviae covered by a thin secretory layer which is easily flaked off and therefore often missing.

Puparium of ♂ white, non-carinate, or with a distinct median ridge. Exuviae pale yellowish.

The body of the ♀ is elongate, often rather narrow in front and suddenly broadening to about the middle and suddenly narrowing again to the pointed pygidium. The margins of the free abdominal segments are not conspicuously produced, but are supplied with numerous gland-openings and a few short, pointed projections. The pygidium has the median lobes moderately produced, their inner margins straight and in close contact, their outer extremities sloping gently backward and twice notched, forming three sub-equal rounded crenulations. The median lobes and the posterior median part of the pygidial area are yellow, and the yellowish coloured spots on the margin may indicate three other pairs of rudimentary lobes. At these points gland-openings are apparent, and small rounded projections may be seen on the margin ; the plates are a little longer than the median lobes and are distributed as shown in fig. 180. Antennal tubercles ± globular, with one curved flagellum. Circumgenital glands in 5 large groups :

12—18  
15—19 15—19  
13—17 13—17

*Habitat* : On *Alternanthera sessilis*, R. Br., Durban ; collected by C. Fuller. On *Alternanthera sessilis*, R. Br., Scottsburg, and on native weed, Natal coast ; collected by C. Fuller, July 1915.

*Collection Nos.* : 177 and 177a.

161. **Chionaspis (Pinnaspis) aspidistrae**, Sign. (Plate vi, fig. 181).

*Chionaspis aspidistrae*, Sign., Ann. Soc. Ent. Fr. (4) ix, p. 443, 1869.

*Chionaspis brasiliensis*, Sign., Ann. Soc. Ent. Fr. (4) ix, p. 444, 1869.

*Chionaspis latus*, Ckll., Psyche, vii, Suppl. 1, p. 21, 1896.

*Chionaspis aspidistrae*, Green, Cocc. Ceylon, ii, p. 110, 1899.

*Hemichionaspis aspidistrae*, Cooley, Spec. Bull. Mass. Exp. Sta. p. 45, 1899.

*Chionaspis aspidistrae*, Newst., Mon. Brit. Cocc. i, p. 187, 1901.

*Hemichionaspis aspidistrae*, Fernald, Catalogue, p. 239, 1903.

*Pinnaspis aspidistrae*, Lindinger, Die Schildläuse, p. 79, 1912.

Scale of adult ♀ variable, largest specimens about 2·5 mm. long, more or less pear-shaped, thin, usually semi-transparent, whitish or yellowish to reddish brown. Exuviae colourless or faintly yellow.

Adult ♀ elongate, broadest across the abdominal segments, which have the margins produced into rounded conical processes in the young adult stage. Pygidium as illustrated (fig. 181). Circumgenital glands in 5 groups :

5—15	
15—23	15—23
17—23	17—23

*Habitat* : On ferns, *Aspidistra*, etc., Cape, Natal, and Transvaal.

*Collection No.* : 176.

162. **Chionaspis (Pinnaspis) proxima** (Leonardi).

*Hemichionaspis proxima*, Leon., Bol. R. Sc. Agr. Portici, p. 193, 1914.

A translation of Professor Leonardi's description is as follows :—

“Female. Body elongate, with the extremity rounded and having the greatest width about the middle. The abdominal segments narrower than the cephalothorax and projecting laterally in well defined lobes, which have their free margins rounded. The lobes of the last abdominal segments have 2–3 long and robust hairs along the free margin. The buccal apparatus with the maxillary-mandibular bristles radiating and extending beyond the posterior extremity of the body.

“Antennae tuberculiform and surmounted with a long flagellum. Posterior stigmata without glands.

“Pygidium with two pairs of lobes, of which the middle pair, which is deeply coloured, has the inner margins approximated and the outer more deeply incised. Those of the second pair are separated from the first by a robust hair, and by the mouth of a large wax-gland. They are very small, slender, somewhat hyaline, with the free margin rounded and entire. On the outer side of each of the second lobes there is first a hair, then the mouths of two large wax-glands, and at a certain distance from these another hair followed by the mouths of two other wax-glands, and lastly near the pre-anal segment a fourth hair.

“The circumgenital glands are in five groups, *e.g.*,

	10		8		12	
21	19	17	19	15	21	
17	17	16	16	22	23	

“The sexual aperture is situated in the middle of four groups of lateral glands. The anal aperture is almost the same height as the sexual opening, but rather more towards the pre-anal segments.

“Colour of the body in specimens treated with acetic acid, yellowish, except the pygidium which is yellow-ochraceous.

“Female scale. Oval, flatly convex, with the secreted portions scant, whitish grey, and the exuviae at the apex and narrower than the scale, and of an ochroleucous colour.

“Dimensions of the scale :

Length of scale	..	..	..	..	..	1,280 $\mu$
Width of scale	..	..	..	..	..	800 $\mu$
Length of larval exuviae	..	..	..	..	..	350 $\mu$
Width of larval exuviae	..	..	..	..	..	220 $\mu$
Length of nymphal exuviae	..	..	..	..	..	750 $\mu$
Width of nymphal exuviae	..	..	..	..	..	470 $\mu$

“Male scale. Elongate, sides parallel, straight or slightly curved, rounded behind, with the dorsum deeply grooved, and the resulting ridges well marked. Larval exuviae yellowish, small and situated at one end. Waxy scale white. Size of scale : length 960 $\mu$  ; width 320 $\mu$ .

“*Habitat*: Collected at Thies (Senegal) and at Mamu on mango, at Konakry on *Anona*, at Hann (Dakar) on *Calotropis procera* and on an undetermined plant ; at Dodowa, at Lagos, at Cotonou (Dahomey), at Quifangando (Angola) and at Pretoria on undetermined plants.

“*Notes*: This species is near *Hem. orlandi*, Leon., from which it can readily be distinguished by the following characters. It has glands at the anterior stigmata and the glands around the sexual aperture are always more numerous ; there are present, although not very apparent, a second pair of lobes, and further, the last four abdominal segments are supplied with hairs, not only the last two as is the case in *Hem. orlandi*.”

This species is not represented in this collection and although a thorough search has been made around Pretoria it has not been found by the writer.

*Habitat* : On an undetermined plant, Pretoria ; collected by Professor Silvestri.

*Collection No.* : 178.

#### Genus **Lepidosaphes**, Shimer.

*Lepidosaphes*, Shimer, Tr. Am. Ent. Soc. i, p. 373, 1868.

*Mytilaspis*, Sign., Ann. Soc. Ent. Fr. (4) viii, p. 841, 1868 (no description).

*Mytilaspis*, Sign., Ann. Soc. Ent. Fr. (4) x, p. 91, 1870.

Scale of adult ♀ elongate, usually narrowed in front and gradually broadening behind. The colour is very variable, but often orange-brown to dark brown. The exuviae are terminal, with the second exuviae covered. The female scales are usually  $\pm$  curved. Ventral scale variable, similar to those of *Chionaspis* spp.

The ♂ puparium is similar to that of the ♀, but smaller and narrower ; the larval exuviae are terminal. The posterior part of the puparium is often separated by a thin transverse band of secretion, which acts as a hinge, allowing the extremity of the scale to be raised to permit the adult ♂ to emerge.

Adult ♀ elongate, with the margins of some of the segments often produced. Circumgenital glands in 5 groups, but each group usually consisting of fewer glands than is normal in *Chionaspis*.

163. **Lepidosaphes pinnaeformis** (Bouché) Kirk. (Plate vi, fig. 183).

*Aspidiotus pinnaeformis*, Bouché, Stett. Ent. Zeit. xii, p. 111, 1851.

*Coccus beckii*, Newm., The Entom. iv, p. 217, 1869.

*Aspidiotus citricola*, Pack., Guide to Study of Insects, p. 527, 1869.

*Mytilaspis fulva*, Targ., Bol. Soc. Ent. Ital. p. 131, 1872.

*Mytilaspis flavescens*, Targ., Ann. R. Min. Agr. p. 84, 1876.

*Mytilaspis citricola*, Comst., Rept. U. S. Dept. Agr. p. 321, 1881.

*Mytilaspis citricola*, Lounsbury, Rept. Ent. C. G. H. p. 67, 1896.

*Mytilaspis citricola*, Green, Cocc. Ceylon. i, p. 78, 1896.

*Mytilaspis pinnaeformis*, Newst., Mon. Brit. Coccidae, i, p. 204, 1901.

*Mytilaspis beckii*, Ckll., Ent. News, xiii, p. 17, 1902.

*Lepidosaphes pinnaeformis*, Kirkaldy, Fauna Haw. iii, 2, p. 110, 1902.

*Lepidosaphes pinnaeformis*, Fernald, Catalogue, p. 313, 1903.

*Lepidosaphes beckii*, Fernald, Catalogue, p. 305, 1903.

Common Name : Mussel Scale.

Scale of adult ♀ elongate, usually ± curved, narrow in front and broadened behind, with a flattened paler marginal area. Colour varying greatly with host-plant, etc., from pale greyish or yellowish brown to reddish- or olivaceous-brown. In size it may reach 3 mm. long and nearly 1 mm. in breadth.

The ♀ puparium smaller, narrower, and more delicate in texture, with sides ± parallel, and colour usually a little paler.

Adult ♀ elongate, narrow in front, widest at the first free abdominal segment, *i.e.*, behind the middle. The colour is generally whitish, or faintly yellowish with the terminal segments darker. The antennae are represented by a small tubercle with two stout curved hairs. The pygidium as illustrated (fig. 183). Circumgenital glands in 5 groups :

	5—8	
9—17		9—17
7—11		7—11

*Habitat* : On croton, Capetown, Port Elizabeth, and Uitenhage (C.P.), Johannesburg (Tr.), and Durban (Natal). On orange, Cape Province, Natal and Transvaal. On *Murraya*, New Guelderland, Natal.

*Collection Nos.* : 262–262e.

164. **Lepidosaphes gloveri** (Pack.) Kirk. (Plate vi, fig. 182).

*Coccus gloveri*, Packard, Guide to Study of Insects, Ed. i, p. 527, 1869.

*Mytilaspis flava*, Targ., Catalogue, p. 44, 1869.

*Mytilaspis gloverii*, Comst., Rept. U. S. Dept. Agr. p. 323, 1881.

*Mytilaspis gloverii*, Lounsbury, Rept. Ent. C. G. H. p. 71, 1896.

*Mytilaspis pallida*, Green, Ind. Mus. Notes, iv, p. 5, 1896.

*Mytilaspis gloverii* var. *pallida*, Green, Cocc. Ceylon, i, p. 85, 1896.

*Lepidosaphes gloveri*, Kirkaldy, Fauna Haw. Is, iii, 2, p. 111, 1902.

*Lepidosaphes gloverii*, Fernald, Catalogue, p. 309, 1903.

*Lepidosaphes gloveri*, Lind., Die Schildläuse, p. 106, 1912.

Common Name : Long Scale.

The scale of the adult ♀ is very long and narrow, 2·5 to 3 mm. long and about 0·5 mm. broad, long comma-shaped, usually reddish or greyish-brown with paler margins; on some host-plants the colour is paler. Exuviae terminal, yellowish. Ventral scale well developed, whitish.

♂ puparium much smaller and more delicate than the ♀ scale, and paler in colour.

Adult ♀ elongate, sides ± parallel, abdominal segments slightly wider, but without prominent lateral projections. The colour when alive is pale yellow. Pygidium as illustrated (fig. 182). Circumgenital glands in 5 groups:

	4	
6—8		6—8
4—5		4—5

*Habitat*: On citrus, Cape Peninsula; collected by C. P. Lounsbury. Also at Port St. Johns, Stanger, and Warmbaths.

*Collection No.*: 261.

#### Genus **Ischnaspis**, Douglas.

Female scale extremely long and narrow, with the first exuviae extending beyond the anterior margin. Male puparium elongate, similar to that of the second stage female, without the central hinge of the ♂ of *Lepidosaphes*.

Adult ♀ very long and narrow, posterior margin of pygidium forming a regular shallow concave depression, from which the median lobes project. Dorsal surface of pygidium with a peculiar lattice-work design. Circumgenital glands in 3 or 5 small groups.

#### 165. **Ischnaspis longirostris** (Sign.) (Plate vi, fig. 184).

*Mytilaspis longirostris*, Sign., Bull. Soc. Ent. Fr. (6) ii, p. xxxv, 1882.

*Ischnaspis filiformis*, Douglas, Ent. Mo. Mag. xxiv, p. 21, 1887.

*Ischnaspis filiformis*, Newst., Mon. Brit. Coc. i, p. 210, 1901.

Common Name: Black Thread Scale.

Scale of adult ♀ 3 to 3·5 mm. long, very narrow, with sides parallel; posterior extremity slightly broader; colour shining black, with greyish margins. Scale very convex, often showing slight indications of transverse ridges, usually straight, but where a number are crowded together the scales often make a regular bend to avoid other scales and then continue again in the original direction. Larval exuviae terminal, brownish in colour; second exuviae occupying about one-quarter of the length of adult scale, covered with shiny black secretion like the remainder of the scale. Ventral scale complete, robust, white or greyish in colour.

Adult ♀ very long, sides parallel, broadest at the free abdominal segments. Colour yellow. Pygidium as illustrated (fig. 184). Circumgenital glands in 3 groups:

	3—4	
4—6		4—6

A few large (to 4 mm. long) specimens in the Cape collection, otherwise typical, have 5 groups of glands. Three of these have:

	4		5		4	
7	7	7	6	7	7	
5	5	3	4	3	3	

*Habitat*: On citrus, Warmbaths (Tvl.). On *Chaetachme aristata* (umkavoti), Durban, Natal; palms, East London, Durban and Pretoria; *Aucuba*, East London. On *Dracaena australis*, East London; collected by C.P. Lounsbury, November 1906.

This species is particularly abundant on citrus at Warmbaths, Transvaal.

*Collection Nos.*: 277–277b and 278.

#### Subfamily ASTEROLECANIINAE.

Adult females fixed to the stem of their host-plants; sometimes causing pits in the stems and thus becoming slightly or almost entirely embedded in the outer tissues. Adults usually enclosed in a more or less horny or glassy cyst, which is most often yellow in colour and, in one genus, has a marginal fringe of glassy filaments. The legs and antennae are most often rudimentary or absent in the adult stage. Figure-8 glands are present in one or more stages.

This subfamily is represented in South Africa by four genera which may be distinguished as follows:—

Test of ♀ usually yellowish, ± transparent, with marginal fringe ..	<i>Asterolecanium</i> .
Test of ♀ dense, almost ligneous, without fringe .. .. .	<i>Lecaniodiaspis</i> .
Test of ♀ ± waxy and without fringe, ♀ without stigmatic spines ..	<i>Cerococcus</i> .
♀ naked, causing shallow rounded galls in stem* .. .. .	<i>Amorphococcus</i> .

#### Genus **Asterolecanium**, Targioni-Tozzetti.

*Asterolecanium*, Targ., Inter. 2nd Mem. Studi Cocc. Catalogue, p. 41, 1869; Sign., Ann. Soc. Ent. Fr. (4) x, p. 276, 1870.

*Planchonia*, Sign., Ann. Soc. Ent. Fr. (4) x, p. 282, 1870.

*Asterodiaspis*, Sign., Bull. Soc. Ent. Fr. (5) vi, p. ccix, 1876.

“Female insect completely enclosed within a thin but compact glassy or horny test, characterised by a continuous marginal fringe of glassy filaments. The test may be hemispherical, flat, or even somewhat concave above. It varies in outline from circular to linear. The surface is usually smooth, with, in some species, erect or curling filaments on the disc, similar to those of the marginal series. . . . At the posterior extremity there is a small opening through which the larvae escape. This aperture is sometimes placed at the end of a tubular extension, which is often more or less elevated. The colour of the test is invariably of a greenish or yellowish tint, but the fringe and dorsal filaments are sometimes tinged with red. . . .

“The adult female insect, denuded of its covering, is at first approximately of the same form as its covering. After oviposition it shrivels up and lies at the anterior extremity of the test, the remaining cavity being packed with ova. The antennae are rudimentary, consisting of a single short joint with a few curved hairs at its extremity. The limbs are totally absent. . . . No stigmatic spines. Anal lobes absent or minute, usually represented by a pair of small tubercles and each bearing a stout seta. In a few species, both tubercles and setae are wanting. Between the setiferous tubercles are usually from two to four smaller tubercles, each bearing a small spine. The anal ring is sunk in a tubular pit which sometimes opens on to the extreme margin, but usually terminates shortly before the margin on the dorsal surface; it normally carries six stout hairs, but is sometimes hairless. . . .

\* See Bull. Ent. Res. ix, p. 112.

“Male puparium of similar structure to that of the female, but smaller and proportionately narrower. The fringe is simpler, consisting only of the nymphal and larval elements. The winged adult emerges from beneath the posterior margin without the aid of any hinged operculum such as occurs in the allied genus *Lecaniodiaspis*.

“Adult male with distinct neck. Antennae ten-jointed, with three or four knobbed hairs at apex. Ocelli large, in two pairs—dorso-lateral and ventral respectively. Rudimentary eyes small, colourless and inconspicuous. Scutellum ample. Halteres absent or obscure. Genital sheath long and sharply pointed. Two long caudal filaments.

“Larva of typical form. Antennae distinctly six-jointed. A marginal series of (usually twenty-eight) paired glands. Posterior extremity with a pair of longish caudal setae” . . . (Green).

*Key to South African Species of Asterolecanium.*

A. Anal ring hairless.

a. Antennae rudimentary.

Anal extremity of test turned up, tubular ; caudal setae of adult ♀ short, stout  
*brevispinum*, sp. n.

Anal extremity of test not prominently upturned or tubular ; caudal setae long  
*variolosum*, Ratz.

aa. Antennae long, 10-jointed, caudal setae long . . . . . *borboniae*, sp. n.

AA. Anal ring large, with 6 long spine-like hairs.

a. Marginal fringe of adult test reddish.

Test small, flattish, usually naked when old . . . . . *pustulans*, Ckll.

Test small, flat ; on acacia . . . . . *conspicuum*, sp.n.

Test large, rounded ; on bamboo . . . . . *bambusae*, Boisd.

aa. Marginal fringe of adult test white.

Test yellow, globular, enveloped in very long fringe . . . . . *euryopsis*, Fuller.

Test greenish or creamy white, fringe short . . . . . *stentae*, sp. n.

166. ***Asterolecanium brevispinum***, sp. n. (Plate vii, fig. 188 ; Plate viii, fig. 197).

Test of adult ♀ about 3 mm. long, 2.2 mm. broad, very convex, with the caudal extremity produced into a narrow upturned process. The colour is bright yellow and somewhat transparent, except at the anterior end which is bright brown in the few specimens at hand, probably owing to the presence of the shrivelled female body. Of the eight specimens in this collection five of the tests are entirely naked. The other three show the presence of long large curved glassy filaments (fig. 188), which were apparently equally long and equally numerous over the whole dorsal and marginal areas. The integument of the body is very thin ; the antennae are small, ± cordate, with two short spurs. The caudal extremity is simple, with a small hairless anal ring ; the caudal setae are represented by short stout spines. The figure-8 glands are comparatively large (fig. 197).

*Remarks.* This species is somewhat like *A. coffeae*, Newst., but the fringe is white instead of yellow, and there are other distinctive differences to be seen in the mounted specimens, particularly the hairless anal ring and short caudal spines.

*Habitat* : On veld bush, Ceres, C. P. ; collected by C. P. Lounsbury, October 1908.

*Collection No.* : 21.

167. **Asterolecanium variolosum**, Ratz. (Plate vii, fig. 190 ; Plate viii, fig. 193).

*Asterolecanium quercicola*, Sign. et Auctt. (nec *Lecanium quercicola*, Bouché).

*Coccus variolosus*, Ratz., Tharander Jahrbuch, xx, p. 187, 1870 (not seen ; *vide* Judeich & Nitsche).

*Lecanium quercus*, Altum (nec Linné), Forstzoologie, iii, Insecten, p. 365, 1881.

*Coccus variolosus*, "Ratzeburg MS.," Hagen, Can. Ent. xix, p. 60, 1887 (no description).

*Planchonia fimbriata* (Boyer) Maskell, Extract, Trans. N. Z. Inst., 1894, p. 63.

*Coccus quercicola*, Sign., Judeich & Nitsche, Lehrb. Mitth. Forstins., ii, p. 1252, 1895.

*Planchonia quercicola* (Bouché) Maskell, Trans. N. Z. Inst. xxviii, p. 396, 1895.

*Asterodiaspis variolosus*, Boas, Dansk. Forstzoologie, p. 395, 1896.

*Planchonia* (*Asterolecanium*) *quercicola* (Bouché) Froggatt, Dept. Ag. N.S.W. No. 175, p. 6, 1897.

*Asterodiaspis quercicola* (Bouché) Newstead, Coccidae of Brit. Is. (Ray Soc.) i, pp. 1, 14, 34, 35, 36 and 39, 1900.

*Asterolecanium variolosum*, Newst., Mon. Brit. Cocc. ii, p. 156, 1902.

Ova pale yellow to light brownish yellow according to age ; about  $190\mu$  long and  $115\mu$  broad.

Larva, just emerged, pale yellow, with legs and antennae hyaline, about  $260\mu$  long and  $145\mu$  broad. Antennae obscurely six-jointed. Caudal lobes small, tuberculate, each with one long seta, averaging about the same length as the antennae. Eyes prominent, lemon-yellow.

In the half-grown female the colour of the insect is clearly visible through the thin transparent test. It is then 0.7 mm. long and 0.55 mm. broad, caramel-brown, with a distinct white fringe and distinct transverse ridges on the dorsum (fig. 190).

At maturity the adult ♀ completely fills the test, which has become stouter and yellower but is still transparent enough to allow the greenish brown colour of the adult insect to show through plainly. At this stage the tests vary in size from 1.2 mm. long by 0.9 mm. broad and 0.26 mm. high to 1.5 mm. long by 1.3 mm. broad and 0.6 mm. high. As the eggs are matured and laid the body of the female shrinks and the posterior end of the cyst serves as an ovisac. At this stage the test is regularly domed and practically smooth, while the fringe has usually more or less worn away. The line indicating the end of the shrunken body is often very distinct, so that the front half of the test appears deep brown and the hind half pale yellow.

After clearing, staining and mounting, the adult ♀ is almost circular, with the anal extremity slightly narrowed. The anal orifice is very small and hairless, with two small spines, one on either side. The caudal lobes are obsolete, but the two long setae persist as shown in fig. 193. The figure-8 glands are small, in a single series all round the body. The antennae are rudimentary, with one long and one short spiny hair (fig. 193a).

*Habitat* : On *Quercus* sp., Cape Peninsula, Elsenburg (C. P.), Johannesburg, Irene, Pretoria and Vereeniging (Tvl.).

*Collection No.* : 18.



168. **Asterolecanium borboniae**, sp. n. (Plate viii, fig. 198).

Test of adult ♀ small, about 1 mm. long and 0.75 mm. broad, rounded in front and rather pointed behind, slightly convex, with the margin rather thickened and slightly crenulate. The extreme posterior extremity appears tubular and is upturned or recurved over the back. There is apparently no marginal or dorsal fringe. The colour is pale greenish yellow and the test is almost transparent, showing the dark body of the female at the anterior end.

When mounted the body is broad pear-shaped, about 0.9 mm. long and 0.6 mm. at greatest width, with the posterior extremity slightly produced and broadly rounded. The characters are very indistinct. The anal ring is small; the caudal setae stout, about 65 to 70 $\mu$  long, and the margin has but a single row of figure-8 glands, which are small, measuring approximately 8 $\mu$  across the pair. They are rather wide apart (about 30 $\mu$ ) and are not associated with simple glands (fig. 189). The mouth-parts, with the rostral loop, average about 185 $\mu$  long.

A ♂ mounted on the type slide from the Cape collection, measures 0.77 mm. long without the antennae and genital spike. The latter is broad and strong and measures 150 $\mu$ . The antennae are 10-jointed, measuring approximately: (1) 20, (2) 26, (3) 60, (4) 64, (5) 74, (6) 70, (7) 68, (8) 58, (9) 50, (10) 46 $\mu$ .

*Habitat*: On leaves of "gorse" (*Borbonia cordata*, Linn.), Ceres, C. P.; collected by T. F. Dreyer, November 1906.

*Collection No.*: 302.

169. **Asterolecanium pustulans** (Ckll.) (Plate vii, fig. 187; Plate viii, fig. 200).

*Asterodiaspis pustulans*, Ckll., Jl. Inst. Jamaica, i, p. 143, 1892.

*Planchonia pustulans*, Ckll., Science Gossip, xxix, p. 77, 1893.

*Asterolecanium pustulans*, Ckll., Bull. Bot. Dept. Jamaica, p. 8, 1893.

Test of adult ♀ about 2 mm. long and almost as broad, nearly circular, with the posterior extremity slightly produced. Dorsum convex, with a rather conspicuous rounded median ridge, but without transverse ridges. When young the test is flat and entirely covered with pinkish filaments, which appear to be divided on the marginal area. When a little older the dorsal filaments are missing, but there is a distinct marginal fringe of rather long pink processes. When full-grown the marginal fringe also is usually lacking. The colour of the test is greenish yellow, except when it contains the shrivelled female or eggs, which show through the semi-transparent test. On apple the insects do not make pits in the bark, nor is there a ridge around them. Marginal row of figure-8 glands single, with the addition of a single row of simple glands.

The figure-8 glands are of two sizes and are scattered over the body surface; the smaller are about equal to the marginal series in size, the others almost twice as large (fig. 200 a). Antennal tubercles prominent, with two curved spines and a minute spur (fig. 200 b). Caudal lobes moderately prominent. Caudal setae 75 $\mu$ . Anal setae 40 $\mu$ .

*Habitat*: On apple, Lourenço Marques; collected by C. B. Hardenburg. On stems of oleander, Lourenço Marques; collected by C. P. Lounsbury, October 1914.

*Collection Nos.*: 300 and B.300.

170. **Asterolecanium conspicuum**, sp. n. (Plate vii, fig. 186 ; Plate viii, fig. 196).

Test of adult ♀ about 1.5 mm. in diameter, almost circular, with a small, narrowly rounded posterior extremity. On some species of *Acacia* the insects cause distinct pits in the bark of the twigs (*A. robusta* ?), but on *A. horrida* this is apparently not the case. Occasionally the bark has been seen to cause a low rounded mound around the insect, producing an effect on the twig very similar to that caused by *Amorphococcus acaciae*.

The test is at first flat, yellowish, with short reddish hairs over and around it. Later it becomes moderately convex, smooth on top, semi-transparent and greenish yellow, with only the marginal fringe persisting. When cleared, the integument is extremely delicate and quite hyaline.

The figure-8 glands in the marginal series are comparatively small and are accompanied by small circular glands of two sizes. The caudal extremity has low rounded tubercles which are scarcely produced, each with one stout spine of moderate length and a shorter one on the inside. The anal ring has six spines almost as long as the longer ones of the lobes (fig. 196).

*Remarks.* This species is often observed to be heavily infested with a Hymenopterous parasite, and in many cases the majority of old tests show the exit holes of such insects.

*Habitat:* On *Acacia* spp. (native species only), Pretoria, Marikana, and South-West Protectorate.

*Collection Nos.:* 17 and 303.

171. **Asterolocanium bambusae**, Boisduval (Plate vii, fig. 185 ; Plate viii, fig. 195).

*Asterolecanium bambusae*, Bdv., *Insectologie Agricole*, 1869.

*Asterolecanium bambusae*, Sign., *Ann. Soc. Ent. Fr.* (4) x, p. 280, 1870.

*Asterolecanium bambusae*, Newst., *Mon. Brit. Cocc.* ii, p. 151, 1903.

*Asterolecanium bambusae*, Green, *Cocc. of Ceylon*, iv, p. 328, 1909.

Mr. Green's description, without reference to figures, is as follows:—

“ Test of adult female oval, convex above, the posterior extremity slightly produced into a blunt point where is a small terminal aperture ; smooth, glassy ; colourless, or tinged with pale green or yellow ; transparent, revealing the form of the insect and eggs beneath. Dried examples assume a more definite ochreous colour, a brown patch at anterior extremity representing the dead body of the insect. Marginal fringe pinkish, consisting of a double series of glassy filaments springing from the margin in pairs, each pair contiguous at the base and for the greater part of the length, but diverging laterally at their free extremities which meet the ends of the adjacent filaments, thus forming a series of narrow loops irregularly crossed by fine web-like threads ; the outermost series continuous, except at anal extremity, and longest ; the second (nymphal) series less than half the length of the outer, and interrupted at more or less regular intervals ; an innermost (larval) widely spaced series of crook-shaped filaments. Length (without fringe) 2 to 2.5 mm. Breadth 1.10 to 1.60 mm. Fringe, outer series 0.1 mm. ; inner series 0.04 mm.

“ Adult female insect at first more or less filling the test. After the deposition of the eggs, the abdomen becomes shrunken and the insect occupies the anterior part of the test only, the remaining cavity being packed with ova. Colour of insect dull

green, the dorsum more or less mottled with reddish brown. Dried insect uniform reddish brown. Rostrum conspicuous, pyriform, approximately central. Antennae submarginal, rudimentary, consisting of an irregular tubercle surmounted by two longish stout bristles and one short spiniform hair. Spiracles conspicuous, subglobular, at a considerable distance from margin, with scattered series of minute pores connecting them with the margin. Abdominal extremity slightly cleft; anal tubercles broad and stout, but not very prominent, each with a long seta at its apex and one or two short stout spines near the base. Anal ring stout, with six stout hairs which just project beyond the margin. Margin with a continuous series of large approximately circular thick-rimmed pores, in pairs, and a double ventro-marginal series of minute pores. There are some scattered paired pores of a slightly larger size on the dorsum, and many simple circular pores on the ventral surface of the abdomen. Length of extended insect 1.25 to 1.75 mm. Breadth 0.80 to 1.25 mm. After oviposition the insect becomes greatly shrunken and does not resume its original proportions during maceration.

“ Early adult female at first pinkish, later dull green, finely maculated with reddish brown. The outermost series of the fringe is at first the shorter, but soon outgrows the nymphal fringe. Traces of the larval fringe can often be distinguished at intervals within the margin.

“ In the nymphal stage the fringe is in a single series, but within the margin are remains of the divaricating filaments of the later larval stage.

“ The newly hatched larva is of an oblong oval form, very pale pinkish or reddish brown. Limbs well developed. Antennae six-jointed, the sixth much the longest, with truncate apex. Margin with fourteen 8-shaped spinnerets on each side, and a median dorsal pair of similar pores immediately above the rostrum. Length 0.2 mm.

“ The larva subsequently secretes a fringe of short glassy filaments which are paired and diverging on the cephalo-thoracic area, but single on the abdominal margin (although the spinnerets giving rise to these latter are of the same form as the others).

“ Ova very pale pinkish or yellowish.

“ Male unknown. A single example was observed, in which the dorsum was distinctly tricarinate and bore a marginal and three dorsal series of curling filaments. This may possibly be the male puparium.”

The caudal extremity and part of the marginal series of figure-8 glands of the adult female are illustrated (fig. 195).

*Habitat* : On stems of large bamboo, Durban ; collected on different occasions by Claude Fuller, C. P. Lounsbury and A. Kelly.

*Collection No.* : 19.

172. **Asterolecanium euryopsis**, Fuller (Plate vii, fig. 192 ; Plate viii, fig. 201).

*Asterolecanium euryopsis*, Fuller, Agr. Journ. C. G. H. xiv, pp. 93-95 and 818, 1899.

As no fresh material of this species has been seen by the writer and all the numerous specimens of this collection are somewhat rubbed the following particulars are taken from Mr. Fuller's description (*l.c.*) :—

“ The infested twigs have the appearance of being covered with a fine soft floss of a yellowish or white colour which is easily rubbed off and the insects exposed. The

scales within which the females live very much resemble small glass beads, or the drops of resin which the plants exude and for which they have no doubt often been mistaken. They are thin and transparent with a yellow tinge of colour, smooth and shining, and very convex, being nearly spherical. Generally the yellow colour of the scale is not noticeable as it appears either brown or dark green, according to the different stages of development of the female inside. In size they are about one-fourteenth of an inch in diameter and a little less than that in height.

“ If these female scales are carefully examined with a magnifying glass it will be noticed that the floss is a production of the insect and that it is secreted through the scale at all parts, but mostly around the margin, and curls up in various directions, so that in fresh specimens the scale is quite hidden. If one of the scales is open at about this time of the year, mid-January, the eggs, small pinkish brown particles, will be found inside. Scales which contain eggs are generally parti-coloured, one half being yellow and the other brown or black. It is the yellow half which contains the eggs, and the yellow colour is due to the scale, whilst the darker portion is the dried remains of the female showing through it.”

Puparium of ♂ about equal to the diameter of the female test in length, slightly less than half as wide, flat, with a slight median keel, yellow and transparent, like an empty female test. There is no definite operculum, such as is found in many species, but the extreme hind margin is split to allow the exit of the ♂.

Adult ♀, cleared and mounted, broad pear-shaped, 1.5 mm. long and 1.2 mm. broad. Body hyaline, with figure-8 glands very large and uniformly scattered except at the posterior extremity, where they are practically absent. The caudal extremity (fig. 201) is deeply excavate, with the part around the anal opening densely chitinised. The caudal setae are replaced by two stout spines, and the spines of the anal ring are comparatively very long and stout.

*Remarks.* This insect became so numerous on the harpuisbosch in certain parts of Cape Colony about the years 1898 and 1899 and appeared to have such a toxic effect upon the host-plant that it was suggested that the insect be spread as widely as possible in an endeavour to kill off the bush, which rendered large tracts of the country around Tarkastad useless. It was recorded in the *Agricultural Journal (l.c.)* that the bushes grew to a height of 8 to 10 feet and that no grass would grow under them.

*Habitat* : On harpuisbosch (*Euryops tenuissimus*, Less.).

*Collection No.* : 20.

173. **Asterolecanium stentae**, sp. n. (Plate vii, fig. 191 ; Plate viii, fig. 199).

Test of adult ♀ about 3 mm. long, regularly oval and very convex, with the extreme posterior extremity slightly upturned. Colour greenish yellow suffused with brown, which is more intense at the margin. Dorsal surface scantily supplied with short white glassy processes.

The young female is similar in form, but is pale translucent green with a white marginal fringe and with numerous glassy filaments on the dorsum. The median line is not pronounced, but bears a large number of long glassy filaments in a longitudinal crest. The marginal fringe is about one-fourth the greatest width of the body in length (fig. 191).

♂ puparium not observed.

Cleared and mounted the adult ♀ is broad pear-shaped, hyaline, except for the mouth-parts, spiracles and anal portion. The figure-8 glands form a continuous single row around the margin, except at the sides in the vicinity of the spiracles, where a double row is present in association with single glands of two sizes. Figure-8 glands are also present in scattered form over the dorsum. A little removed from the posterior end is a transverse series of large opaque glands reminding one of the grouped glands of the DIASPINAE (fig. 199). The antennae are small tubercles with two or three small spines (fig. 199, b).

*Remarks.* This insect is obviously very similar to *A. thesii*, Douglas, both in general appearance and microscopic characters. It is, however, slightly larger and could be distinguished by the slight difference in colour and the slightly upturned posterior end of the test.

*Habitat:* On stems of *Caralluma caudata* (Asclepiadaceae), sent in by Miss S. Stent, July 1916. Also on *Huernia transvaalensis*, Stent, and *Stapelia* sp., in Rockery at Division of Botany, Pretoria.

*Collection No.:* 29.

Genus **Lecaniodiaspis**, Targ.

*Lecaniodiaspis*, Targ., Bol. Soc. Ent. Ital. i, p. 261, 1869.

*Lecaniodiaspis*, Ckll., Can. Ent. xxxi, p. 267, 1899.

*Prosopophora*, Douglas, Ent. Mon. Mag. xxviii, p. 207, 1892.

*Birchippia*, Green, Ann. Mag. Nat. Hist. (7) vi, p. 450, 1900.

The adult ♀ in this genus is entirely enclosed in a compact tough papery test, which is generally broad oval in shape and buff or yellow in colour. Its upper surface may be flat or convex, and may be ± smooth or ribbed or carinated. Occasionally there are small waxy processes on the dorsum, and the insects form shallow pits in the bark of the host-plant. In the South African species only are there waxy plates on the dorsum. There is a small, ± circular aperture at the posterior extremity of the test to allow the larvae to escape, but this is usually obscured until the eggs have hatched. The test, when first formed, fits closely to the body of the female, which gradually shrinks with oviposition until the test becomes in reality an ovisac.

The adult ♀ is sometimes apodous; in other cases there are rudimentary legs or, more rarely, they are well developed. The antennae are usually well developed, seven to nine segments being most common. The anal extremity is slightly cleft, with the outer angles generally rounded and bearing a stout seta and a few spines. The base and inner angles of the cleft are supplied with a bilobed thickening, which reminds one very strikingly of the anal plates of the LECANIINAE. The dorsal anterior margin of the cleft has a transverse chitinous band, in front of which is situated the anus. The anal ring bears 8 to 12 hairs, usually 10. The derm is plentifully supplied with 8-shaped glands, and on the dorsal surface of the abdomen there are often two longitudinal rows of cribriform plates.

*Key to South African Species of Lecaniodiaspis.*

A. Legs absent.

Test smooth, flat, not divided into plates .. .. . *mimosae* (Mask.)

Test divided into plates .. .. . *natalensis*, sp. n.

AA. Legs rudimentary.

Test smooth, rounded above .. .. . *magna*, sp. n.

AAA. Legs well developed.

Shorter than antennae .. .. . *brabei*, sp. n.

Longer than antennae .. .. . *tarsalis*, Newst.

174. **Lecaniodiaspis mimosae** (Mask.) (Plate ix, fig. 202 ; Plate x, fig. 215).

*Prosopophora prosopidis* var. *mimosae*, Mask, N. Z. Trans. xxix, p. 316, 1897.

*Lecaniodiaspis mimosae*, Ckll., Check List Suppl. p. 392, 1899.

Test of adult ♀ about 4·5 to 5 mm. long., 3·5 mm. broad and 1·7 mm. thick, with the dorsum almost flat, the upper and lower surfaces almost parallel, with the margins rounded. When not crowded together the specimens are glued flat to the bark, button-like, but when a number are massed together they are often much distorted. The colour of the young is creamy, but later becomes suffused with brown, with a more distinct median line. The dorsal surface is flaky, without keel or transverse ridges.

♂ puparium 1·8 mm. long, 1 mm. broad, elongate oval, rather more pointed in front, flat, with a median keel and faint transverse ridges, pale brown, with a distinct semi-circular operculum.

When boiled in KOH and cleared, the derm of the adult ♀ is thin and hyaline, and the numerous gland-pores are very conspicuous. There are two dorsal rows of cribriform plates, 5 in each row. These are ± circular, small, 24 $\mu$  in diameter and minutely perforate (fig. 215, b). The antennae are long (about 180 $\mu$ ), with seven or eight joints, sometimes appearing 9-segmented owing to a pseudarticulation in segment 6. The terminal segments bear several long stout processes with blunt extremities (fig. 215). Legs absent; in two cases indications of extreme rudiments of legs were found, in one case represented by leg i. and in the other by leg ii. The two pairs of spiracles are broad, and the stout tracheae generally remain after treatment with potash. The anal lobes are short; each bears one very strong spine and a few short conical ones. The stigmatic spines are long, stout, slightly curved, and clubbed (fig. 215, a).

*Habitat*: On *Acacia horrida* and other species, Fort Beaufort; collected by C. P. Lounsbury, September 1900. Port Alfred; collected by A. Kelly, March 1915. Namaqualand (Cape No. : 1254).

*Collection No.* : 22.

175. **Lecaniodiaspis natalensis**, sp. n. (Plate ix, fig. 205 ; Plate x, fig. 213).

Test of adult ♀ about 2·5 mm. long and 1·6 mm. broad at the widest part, which is about the middle, flat, somewhat elliptical with the two ends narrowed. In some cases the anterior end is broadly rounded and the posterior extremity pointed. The dorsum is flat and covered with a layer of white material, which is distinctly divided into three series of ± rectangular plates, the appearance of which suggests an *Orthezia*. The median series is not quite so broad as the two lateral ones and consists of nine patches, the number which is apparently constant for each of the two lateral series also (fig. 205).

When placed in boiling KOH the body becomes pinkish but the liquid is not appreciably coloured.

The body of the adult ♀ is flat, about 1·8 mm. long, and 1·2 mm. broad at the widest part, which is just in front of the middle. The anterior end is often suddenly narrowed at the level of the antennae and the anterior margin rounded. The posterior portion tapers to the deeply cleft extremity. The mouth-parts are

comparatively small, with a long rostral loop. The antennae (fig. 213, *a*) are short, annular, of four or five segments. Legs entirely absent. The whole dorsal surface has numerous scattered, minute 8-shaped glands. Cribriform plates (fig. 213, *b*) small, inconspicuous, few in number. The anal cleft is as shown in fig. 213. The caudal setae are strong, and shorter than those of the anal ring ( $60\mu$ ). In addition to the two caudal setae there are five or six short spines on each caudal lobe. Anal ring with 8 long hairs ( $100\mu$ ).

*Habitat* : On stems of *Hibiscus*, Durban ; collected by C. P. v. d. Merwe, July 1916.

*Collection No.* : 301.

176. **Lecanodiaspis magna**, sp. n. (Plate ix, figs. 206, 209 ; Plate x, fig. 214).

Adult females congregate on the crown of the host-plant at just about ground-level.

Test of adult ♀ about 6 mm. long, 4.5 mm. wide, and 3 mm. high, regularly broad oval, or slightly narrowed in front and with the hind margin very slightly flattened, with a faint median indentation. The dorsum is very convex, ventral surface slightly rounded. The test is entire and homogeneous in texture, smooth or very faintly roughened, without ridges, but occasionally with very faint ribbed corrugations at the sides. The colour is of a uniform biscuit tint (fig. 206).

When received, the largest specimens removed for mounting contained many eggs. The body entirely fills the test, which is thin, tough and papery. In boiling KOH the test breaks down and the liquid is stained a rich brown colour, while the ♀ takes on a rose-pink hue. When boiled for some time the body wall is clear, hyaline, and very delicate.

Adult ♀, cleared and mounted, about 3.7 mm. long, almost circular, hyaline, with the antennae and anal armature dense. Legs extremely rudimentary, represented by a small ( $50\mu$ ) conical tubercle, with a minute process at the tip and several delicate hairs which appear to represent the digitules (fig. 214, *a*). Antennae comparatively short ( $170\mu$ ), of nine segments, which are annular and slightly tapering to the apex (fig. 214). Anal ring with 10 stout hairs. Cribriform plates small, with comparatively large pores. Caudal spines short ( $27\mu$ ), two on each lobe. The anal plates are broad, each with deep wrinkles and two stout spines, and possibly two more slender, one above and one below (fig. 214, *b*). These latter are missing in the slides, but the pores indicate their presence.

*Remarks.* Two plants were submitted, the one crown bore seven large females ranging from 5 to 6 mm. in length, the other about 50 specimens identical in appearance but smaller, all the tests being about 3 mm. in length (fig. 209).

*Habitat* : On crowns of native bush with small narrow leaves ; collected at Groot Drakenstein and sent in by C. W. Mally, June 1916.

*Collection No.* : 27.

177. **Lecanodiaspis brabei**, sp. n. (Plate x, figs. 218–218, *a*).

Test of adult ♀ about 3.2 mm. long, 2 mm. wide, and 1.5 mm. high, oval, convex, ochre-yellow, with a thin covering of greyish secretion which is easily flaked off. The dorsum is not quite smooth, but has faint rounded rib-marks and occasionally a faint

median ridge. With the roughened secretion removed the colour and general appearance of this species is very like the figure Green gives of his *L. azadirachtae*.

♂ puparium of the usual type, pale buff-coloured, not yellow as is the ♀ test.

Larva yellow, 0.5 mm. long, and 0.24 mm. wide. Antennae and legs well developed. Antennae 5-segmented; basal segment cylindrical, hardly as wide as ii. The posterior extremity of the body is narrowed and deeply and roundly indented, so that there appear to be two large caudal lobes. The inner margins of these have chitinous plates similar to those of the adult; the transverse chitinous bar in front of these is not very conspicuous. The caudal lobes each bear one very long seta, about 0.2 mm. in length and one or two short spines.

Second stage ♀ about 1.2 mm. long. In this stage the body has become more rounded, especially at the posterior extremity. The caudal lobes are comparatively shorter and their extremities are curved together, and the long caudal setae of the larva are replaced by two stout spines about  $35\mu$  in length. The antennae and legs are situated further from the margin and appear proportionately smaller. The antennae are 6-jointed.

Adult ♀, cleared and mounted, about 3 mm. long, almost circular, with the derm colourless, hyaline. The legs are well developed, but small, shorter than the antennae ( $180\mu$ :  $250\mu$ ). The three pairs of legs are about equally developed (fig. 218, c). The antennae are normally 8-jointed, but occasionally appear 9-jointed through the pseudo-articulation of the 5th segment (fig. 218). There are scattered stout spines, about  $27\mu$  long, on thick bases, at intervals around the margin (fig. 218, b). The stigmatic spines are usually unequal, one long and one short, curved, slightly clubbed (fig. 218, a). Figure-8 glands small, uniformly scattered over the surface.

*Remarks.* This species is similar in many respects to *Lecaniodiaspis africana*, Newst., but is readily distinguished by the smaller size and the fact that the antennal segments iii, iv, v, and vi, are longer than wide and the tarsus is considerably longer than the tibia (fig. 218, c).

*Habitat:* On wild almond (*Brabeium stellatifolium*, Linn.); collected by C. P. Lounsbury, Newlands, 1896 (Cape No.: 1274); also collected by C. W. Mally, December 1915.

*Collection No.:* 298.

178. **Lecaniodiaspis tarsalis**, Newst. (Plate ix, fig. 203; Plate x, fig. 217).

*Lecanium tarsalis*, Newst., Bull. Ent. Res. viii, p. 16, 1917.

Test of young ♀, about 1.5 mm. long, flat, with a distinct median keel, purplish grey in colour.

Test of adult ♀ buff-brown, about 3 mm. long, 2 mm. broad and 1 mm. high, with the dorsum roughened by a series of low tubercular projections. There is a distinct median series and a sub-dorsal row on each side, the marginal areas being irregularly roughened.

♂ puparium creamy white, about 1.3 mm. long, and 0.9 mm. wide; similar in form to the ♀ test but more flat and much lighter in colour.

Adult ♀, mounted, about 1.6 mm. long and 1.1 mm. broad, regularly oval, with a complete regular marginal row of stout spines  $30\mu$  in length, about 15 on each side



(fig. 217, *b*). Legs and antennae present. All three pairs of legs about equally developed, all longer than the antennae. Antennae 9-jointed (fig. 217). Caudal setae stout, about  $80\mu$  in length. Cribriform plates small ( $12\mu$  diameter), yellow (fig. 217, *a*). On the venter, a little anterior to the position of the anal ring, are two long straight slender setae, about  $115\mu$  in length, pointing backward.

*Habitat*: On native tree (*Dombeya rotundifolia*), Pretoria; collected by the writer, September 1914. On *Hibiscus* in a nursery, Pretoria; collected by A. Kelly, June 1916.

*Collection No.*: 23.

Genus **Cerococcus**, Comst.

Adult ♀ enclosed in a dense waxy test without a marginal fringe as in *Asterolecanium*, and generally without waxy processes. The test is usually dense, opaque, not semi-transparent, and simulates the test of a *Tachardia* more than that of an *Asterolecanium*. The posterior end of the test is sometimes slightly produced and upturned, with the anal aperture at the extremity.

Adult ♀ with the caudal extremity produced into a rounded protuberance which bears the anal armature. There are two stout lobes, each with a long seta and several spines; the space between them is  $\pm$  chitinised, with a prominent rounded tongue-shaped plate. Antennae and legs rudimentary. Derm with conspicuous 8-shaped glands. Stigmatic spines absent.

♂ puparium elongate, tubular, with a large oval or circular operculum above the posterior extremity.

*Key to South African Species of Cerococcus.*

- A. Test smooth,  $\pm$  globular, brown .. .. . *ovoides* (Ckll.).  
 AA. Test rough, ornate, brick-red .. .. . *ornatus*, Green.  
 AAA. Test yellowish or brownish.  
     Marginal 8-shaped glands much larger than those on dorsum *passerinae*, sp. n.  
     Marginal 8-shaped glands little if any larger .. .. . *royenae*, sp. n.

179. **Cerococcus ovoides** (Ckll.) (Plate x, fig. 219).

*Pollinia ovoides*, Ckll., The Entom. xxxiv, p. 225, 1901.

Professor Cockerell's description is as follows:—

“♀ scale a rounded conical object much like a Lepidopterous egg, about  $1\frac{1}{2}$  millim. diam., roughened radiately, pale brown with four longitudinal stripes of white secretion converging to the top of the scale, which is usually reddish.

“♂ scale elongated, about  $\frac{2}{3}$  millim. long, roughened, yellowish or pink, with an oblique terminal cap.

“♀ scales, soaked in liquor potassae, give a deep orange-brown colour, and the insects themselves turn deep crimson; ♀ adult globose; skin with many simple round glands and tubular glands, and some figure-of-8 glands; anal ring with numerous hairs; caudal lobes prominent, conical, about  $45\mu$  long, with a few small spines, and ending in stout bristles about  $90\mu$  long; mouth-parts well developed, but small; labium short and broad, dimerous, the last joint with bristles on its margin; antennae

represented by small rounded tubercles about  $15\mu$  long, with a little terminal prominence which appears to represent a second joint, and about six stout bristles about  $18\mu$  long; spiracles small but distinct; legs wanting.

“Embryonic larva with a row of figure-of-8 glands down each side, and dorsal and subdorsal rows of small round glands, the latter failing caudad, the last five glands of the dorsal rows being absent in the subdorsal; labium very short and broad, cup-shaped; form of insect elongate-pyriform; antennae thick, 6-jointed, last joint not very greatly longer than the one before, and notched as in *P. pollini*.”

The antennae and caudal extremity are figured (Plate x, figs. 219 and 219, a).

*Habitat*: On stems of undetermined native tree, Back Beach, Durban; collected by C. Fuller. On fig, Pietermaritzburg; collected by A. Kelly, 1911.

*Collection No.*: 26.

### 180. *Cerococcus ornatus*, Green.

*Cerococcus ornatus*, Green, Cocc. Ceylon, iv, p. 306, 1909.

Mr. Green's description, omitting figure references, is as follows:—

“Test of adult female irregularly oval, the posterior extremity (in fully matured examples) produced into a short upturned tube. In earlier examples this caudal extension is in the form of a trough, partially closed above by stout curling filaments. Dorsum strongly convex, the sides sloping inwards to the comparatively narrow ventral area, which is thin and easily ruptured. Dorsum with three prominent transverse waxy ridges produced, at the middle and two sides, into stout pointed processes; the lateral processes longest, tapering to fine points, and projecting (in fresh examples) considerably beyond the margin, which is itself thickened and tubercular. Posterior margin with two or more tapering processes directed backwards. There are several pairs of short white curved filaments on the median line, behind the third transverse ridge. In older examples the waxy processes are gradually reduced until they practically disappear, and old worn tests are more or less globular in form. Colour of early test purplish brown; the ridges, processes, and thickened margins bright coral-red or crimson. Older examples become at first uniform pale red, and finally dull reddish brown. There are two white waxy ridges on each of the sloping sides, extending from the first and third lateral processes, respectively, to the stigmatic openings. Length 2 to 2.5 mm. Breadth (exclusive of processes) 1.12 to 1.50 mm.

“Male puparium oblong, narrow, rounded at the extremities. An inconspicuous median and two prominent transverse ridges, the latter terminating laterally in pointed processes. A smaller pointed process, on each side, close to anterior extremity. Posterior third occupied by a large circular operculum with raised margins. Colour pale red to crimson. Length, 1 mm. Breadth, 0.45 mm.

“Adult female insect of a delicate greyish tint, in life. Broadly oval: the terminal segments abruptly narrowed. Abdomen terminating in two prominent irregularly conical lobes, with a bluntly conical median plate between them; each lobe with a triangular chitinous plate on its inner side and a longish stout seta at its apex. Ventral lip of anal aperture with four or more long stout spines. Anal ring with eight hairs. Rudimentary antenna with from eight to twelve stout hairs on its apex.

Limbs entirely wanting. Dorsum with numerous large and conspicuous paired glands, disposed principally in three broad transverse bands across the middle of the body, leaving the anterior and posterior areas comparatively free. The first and third bands divide near the margins, where they enclose a series of small circular glands. There is a straggling group of the large paired glands within the anterior margin; a short marginal series on each side of the abdomen, just before the constriction; and another short series, on each side, close to the anal lobes. Amongst the larger paired glands, and scattered over other parts of the dorsum, are many of a much smaller size. Cribriform plates small, each with a broad densely chitinous border and areolate centre; in two groups of four, immediately anterior to the narrowed part of the abdomen. Venter with small circular glands in loose transverse series across the abdominal segments, and some scattered paired glands of the smaller size. Length, 2 mm.

“Adult male uniform dark brown. Wings hyaline; nervures colourless. Genital sheath very broad at base; sharply pointed at extremity. Although the single example examined showed no waxy caudal filaments, there is a distinct glandular pit on each side, giving rise to fine paired setae such as usually support caudal filaments. Length, 1 mm. Expanse of wings, 1.75 mm.”

*Habitat*: On stems of *Aberia caffra* and *Calodendron capense*, Thunb.; collected at Pietermaritzburg by A. Kelly, April 1917.

*Collection No.*: 95.

181. **Cerococcus passerinae**, sp. n. (Plate x, fig. 216).

Test of adult ♀ about 2.4 mm. long, elongate, convex, with the posterior end slightly produced, thin, brittle, dull straw-yellow. The dorsum is convex, with a wide shallow groove from about the middle to the caudal end. The remainder of the test is uniformly arched, but in a few specimens there appears to be a submarginal series of low tubercles.

Puparium of ♂ usual, elongate, paler in colour than the ♀ test.

Cleared and mounted the adult ♀ is broad pear-shaped, with the prominent anal portion produced. The integument is thin and hyaline, with 8-shaped glands numerous but scattered. Those of the marginal series are large, and mostly in a single row, but at the sides the series becomes double or treble for a short distance. The 8-shaped glands scattered over the dorsum are smaller, being only about half the diameter of those in the marginal series. The rudimentary antennae consist of small conical protuberances each with about 6 spines (fig. 216, *a*). The caudal lobes are prominent, with their inner faces chitinised and the spines strongly developed (fig. 216).

*Habitat*: On native shrub (*Passerina ericoides*, L.; Thymelaeaceae); collected by C. P. v. d. Merwe at Montague, C. P., October 1914.

*Collection No.*: 24.

182. **Cerococcus royenae**, sp. n. (Plate ix, fig. 210).

Test of adult ♀ varying in size to 3 mm. long and almost as broad and high, very roundly convex, with a short caudal prominence around the aperture. The test is comparatively thick and brittle, dull orange-yellow to orange-brown in colour, without fringe or processes of any kind.

The ♂ puparia are elongate, tubular, open behind, straw-coloured, with a brownish secretion, which often appears in  $\pm$  rectangular patches on each side of the median line (fig. 210).

The mounted ♀ is almost circular, with the caudal extremity slightly produced. The integument is clear and has a marginal series of 8-shaped glands of medium size. Other similar glands are scattered over the dorsum and these are of about the same size as those of the marginal series, not much smaller as in *C. passerinae*. The antennae are small conical protuberances with several curved spines, and are longer and narrower than in *C. passerinae*. The caudal lobes are moderately long, but are not thickened on their inner edges, and a short distance in front of the anal ring are two chitinised discs.

*Habitat*: On stems of blauwbosch (*Royena pallens*, Thunb.; Ebenaceae), Fauresmith, O. F. S.; collected by J. C. Faure, March 1915.

*Collection No.*: 96.

#### Subfamily TACHARDIINAE.

“Insects enclosed in a resinous cell with three orifices. Adult females apodous, with the terminal segments produced into a tail-like organ bearing, at the extremity, the anal orifice, which is surrounded by a broken setiferous ring” (Green).

#### Genus **Tachardia**, R. Blanchard.

Professor Cockerell (“The Entomologist,” xxxiv, p. 249, 1901), before describing *Tachardia albida* from Natal, gives the following synopsis of this genus:—

“*Tachardia*, Blanchard (Lac Insects).

This genus contains some very diverse elements, which will no doubt eventually be treated as genera. We may for the present recognise three subgenera:—

- (1) *Tachardia* proper. Type, *T. lacca*, the East Indian commercial lac. Female very elongated, vasiform; the individuals enclosed in masses of lac surrounding the twigs, never separate. I know of only one species of this group.
- (2) *Tachardiella*, subg. nov. Type, *T. cornuta*, Ckll. Female more or less globular; individuals often separate. This includes the species of America and Australia.
- (3) *Tachardina*, subg. nov. Type, *T. albida*, with the characters given below.”

It will be noticed from the description of *T. albida* given later that the main points of difference between this and the other species mentioned by Professor Cockerell are (a) the tests are collected in large masses; (b) the caudal process is peculiar; (c) the spine is absent. Of these characters none is peculiar to the African species, and *T. albida* is the only species I know of in which the spine is absent. I therefore follow Newstead in disregarding the subgenera for the present and including the six South African insects in the genus *Tachardia*.

I might mention that the insects in this sub-family are by far the most difficult to make satisfactory microscopic slides of, as nearly all the old dry specimens seem to be eaten out, and after dissolving the lac test there usually remain but a few fragments which are quite useless for determination. Fresh material is therefore most desirable in this group.

*Key to South African Species of Tachardia.*

## A. Antennae present.

*a.* Test crimson or deep red, with pale radiating lines .. *actinella*, Ckll. & King.

*aa.* Test deep shellac-brown,

*b.* Rudimentary legs represented by small conical spines .. *minor*, sp. n.

*bb.* Legs entirely absent .. .. . *karroo*, sp. n.

## AA. Antennae absent.

## B. Spine present.

*a.* Test deep purplish brown, with radiating ridges .. .. *decorella* (Mask.)

*aa.* Test yellowish brown .. .. . *affluens*, sp. n.

## BB. Spine absent.

*a.* Test whitish or pale yellow .. .. . *albida*, Ckll.

183. **Tachardia actinella**, Ckll. & King (Plate ix, fig. 208 ; Plate xi, fig. 221).

*Tachardia actinella*, Ckll. & King, The Entom. xxxiv, p. 342, 1901.

The original description is as follows :—

“ ♀. Scale about 3 mm. long, 3 broad, and scarcely 2 high, rounded and depressed, dark crimson, with about sixteen strong, but obtuse, radiating yellowish white ridges ; centre of scale formed as in *T. decorella*. The scales are mostly separate, but sometimes two or more coalesce.

“ ♀. Dark red,  $2\frac{1}{2}$  mm. long,  $1\frac{1}{2}$  broad ; bright pink when boiled in caustic potash ; this colour is due to the internal juices, the skin being perfectly colourless. Antennae stout, cylindrical, pale, about  $140\mu$  long, 52 broad at base, 36 in middle, 28 at end, obscurely four-jointed. Lac glands with over 60 orifices. Mouth-parts about  $141\mu$  broad. Spine well-developed,  $120\mu$  long, rapidly enlarging  $35\mu$  from tip to a very broad ( $95\mu$ ) base. Anal ring with 10 long bristles ; chitinous anal plate roughly semicircular, posteriorly with a deep linear incision  $60\mu$  long ; on each side of the anal plate is an elongated process terminating in two sharp spines, the structure being apparently the result of a fold in the plate. Anteriorly, the anal plate is tuberculated.

“ ♂. Scale cylindrical, elongated, of the usual form ; dark red.”

A large collection of ♂ material was received from Grahamstown in March 1915 when the insects were just emerging. The following particulars are therefore added from notes made at the time :

♂ test deep madder-red, glassy, about 1 mm. long and 0.5 mm. broad ; flat, upper surface slightly arched, with a median flatly-rounded keel with transverse striae. The anterior end is rounder but narrower than the posterior extremity, which is somewhat elevated, so that the opening from which the ♂ emerges appears dorsal. Prior to emergence this orifice is closed by a glassy cap. When the insect is ready to emerge the cap is raised from behind and the two white caudal filaments protrude.

Body of ♂ adult (freshly mounted) 1.2 mm. long, and 0.33 mm. broad across the thorax. Genital spike 0.24 mm. long. Wing 0.95 mm. long. The body and scutellum are of a beautiful madder-red colour ; the eyes are black ; the legs and antennae pale, almost colourless ; and the wings are clear but iridescent.

Caudal filaments (2) long, from  $1\frac{1}{4}$  to  $1\frac{1}{2}$  times the length of the body. These are dense white, slender, and in life widely divergent. The antennae are 10-jointed, the joints, when freshly mounted, measuring approximately :—(1) 30, (2) 58, (3) 100, (4) 92, (5) 85, (6) 68, (7) 58, (8) 68, (9) 50, (10)  $65\mu$ .

*Habitat* : On orange, Qumba, C. P. On pomegranate, Ladysmith, Natal. Also on native trees at East London and Grahamstown, C. P., Natal and Transvaal.

*Collection Nos.* : 71, 75, 325.

184. **Tachardia minor**, sp. n. (Plate xii, fig. 227).

♀ test 1.5 to 2 mm. in diameter, rich castaneous brown, with the larval cast conspicuous. Viewed from above the test is broad heart-shaped; edges of caudal orifice slightly elevated; spiracular openings obsolete. In the material examined the ♀ tests always appeared singly on the twigs, never massed as in *T. actinella*.

♂ puparium about 1 mm. long, varying in colour from pale yellowish brown to deep castaneous; dorsal area strongly ridged.

When cleared and mounted the adult ♀ is almost circular and very transparent; the mouth-parts are comparatively large, averaging about  $170\mu$  long by  $82\mu$  at their greatest width. On each side, extending backward from the middle of the mouth-parts, is a series of three small conical spines, which appear as though they might indicate the extreme rudiments of legs. The antennae average  $60\mu$  in length and are obscurely 3 or 4-jointed. Lac plates varying from 57 to  $68\mu$  in length; about  $48\mu$  broad; with few glands, the number varying from 14 to 28 in specimens examined. Spine about  $68\mu$  long and  $54\mu$  across the base, distinctly funnel-shaped, narrowing at about half its length. Chitinous anal plate almost semi-circular, with the basal portion rugose and its apex four lobed. Anterior spiracle with 16 simple glands.

*Habitat* : On rhenosterbosch (*Elytropappus rhinocerotis*, Less.); collected by C. P. v. d. Merwe, Montague, C. P., November 1914.

*Collection No.* : 25.

185. **Tachardia karroo**, sp. n. (Plate xii, fig. 230).

♀ test 2.5 to 3.5 mm. in diameter, sometimes single, but usually massed together on the thicker stems of the plant. Somewhat similar to *T. minor* but more spherical, larger and paler in colour. In a number of cases the test is semitransparent, deep amber-yellow, with three distinct pale lines radiating from the median dorsal ridge to the margins in the form of a broad Y.

♂ puparium comparatively short, deep chestnut-brown.

When cleared and mounted the following characters may be determined :—The antennae are obscurely 3-jointed, about  $105\mu$  long and  $27\mu$  wide at the base. The apical joint has at its tip 3 or 4 short spines. The anterior spiracle has a few (2 or 3) simple glands. Lac plates about  $120\mu$  long by  $110\mu$  broad, with 62 to 84 gland openings. Spine about  $90\mu$  long and  $78\mu$  across the base; deep funnel-shaped, narrowing about one-third to one-fourth its length from the tip. Anal plate broader than long; basal portion coarsely wrinkled, apical part with 4 small pointed lobes.

*Habitat* : On rhenosterbosch (*Elytropappus rhinocerotis*, Less.) in association with *T. minor*; collected by C. P. v. d. Merwe, Montague, C. P., November 1914.

*Collection No.* : 324.

186. **Tachardia decorella** (Mask.) (Plate ix, fig. 212 ; Plate xi, fig. 222).

*Carteria decorella*, Mask., N. Z. Trans. xxv, p. 247, 1892.

*Tachardia decorella*, Newst., Bull. Ent. Res. viii, p. 127, 1917.

The ♀ tests generally coalesce so as to form a mass completely surrounding the thin twigs of the host-plant, often for a length of 30 to 40 mm. The individual tests, at maturity, are almost globular, but flattened above, 3 to 4 mm. in diameter, deep purplish brown, or almost black, with dull grey speckles arranged in radiating ridges. The intermediate spaces are somewhat glossy. The lac is very hard and brittle.

The larval tests are deep red. Those of the young females are flat and button-like, brown, with the reddish larval cast superimposed and with the grey ridges more pronounced than in the adult.

When mounted the body is broad ovate and transparent. The anal plate is densely chitinised, about  $190\mu$  broad and  $170\mu$  long, with its basal portion embossed with very small "grease spot" design. The mouth-parts are about  $185\mu$  long and  $126\mu$  across the middle. The lac-gland plates are approximately  $170\mu$  long and have numerous gland openings, all the specimens examined having over 100. The spine is shallow funnel-shaped, about  $120\mu$  long and  $112\mu$  across the base, becoming abruptly narrowed at about two-thirds its length from the apex. Near the margins of the segments are more or less circular groups of simple glands.

This insect differs in some small details, such as the colour of the test, from Maskell's description of *T. decorella*, but the marginal gland groups and other characters are so close that, for the present at least, I ascribe his name to the species.

*Habitat*: On *Acacia karroo*, Linn., Crocodile River, Transvaal. On *Acacia melanoxylon*, Zoological Gardens, Pretoria.

*Collection No.*: 323, 326.

187. **Tachardia affluens**, sp. n. (Plate xi, fig. 224).

Test of adult ♀♀ usually found singly on the stems of host-plants ; occasionally in groups of two or three, never in large groups.

Test ± globular, almost as deep as wide, sometimes slightly tapering to the top, about 3 mm. in diameter, yellowish to dull shellac-brown with a reddish spot in the centre. The test is generally smooth, but may show indications of faint ridges to the margins, which are prominent in young specimens.

♂ puparium exceptionally long and narrow, pale yellowish brown, with reddish larval cast ; posterior aperture closed by a rough buff flap.

When mounted the characters are indistinct, but the following measurements have been supplied from the examination of a range of specimens:—Mouth-parts about  $170\mu$  long and  $100\mu$  wide. Spine about  $100\mu$  long and  $85\mu$  at base, rapidly tapering so that the apical half is almost parallel-sided. Lac plates small, about  $85\mu$  long and  $75\mu$  broad, with approximately 40 gland openings, all in a compact group. The anal plate is more straight-sided than usual and ends in four almost equal lobes. Its base is slightly wrinkled and has scattered transparent spots, giving it the grease-spot appearance something like the design on the dorsum of a *Pseudaonidia*.

*Remarks.* This species resembles *T. longisetosa*, Newstead, but is easily distinguished by the fact that the hairs of the anal ring are of normal length, and the glands of the lac-plates are fewer in number and not scattered.

*Habitat:* On *Euclea* sp. and other native plants; very common around Pretoria and apparently widespread throughout the Union.

*Collection No.:* 76.

188. **Tachardia albida**, Ckll. (Plate ix, fig. 211).

*Tachardia albida*, Ckll., The Entom. xxxiv, p. 249, 1901.

Professor Cockerell's description is as follows:—

“Forming smooth yellowish-white masses on the twigs; the extremely dense and hard lac of the several individuals running together; masses up to 10 mm. diam., and 30 in length. The individuals are marked externally by orange patches, each presenting a small corrugated or segmented ridge, and an aperture. Cavities for females globular to subpyriform. Male scales of the usual elongated form, red, with a very short dorsal segmented ridge, about one-third of total lengths of scale.

“♀. After boiling in liquor potassae globular, giving a very fine crimson colour. Skin after boiling transparent, truncate and caudal processes remaining ferruginous. Mounted female on slide about 5 mm. diameter. Truncate processes (or ‘lac tubes’) very short, orifices very small and numerous. Spine apparently absent. Caudal process peculiar; transversely oblong or subreniform, with a deep posterior notch, on each side of which are two lobules; lateral hind margins bearing a sharp spine; surface finely reticulated; anal ring hidden, only the ends of the numerous bristles projecting. Spiracles large and well-developed. Mouth-parts well-developed, but small, about  $135\mu$  broad; “lobes oraux” (as figured by Targioni-Tozzetti in *T. lacca*) very large.

“Larva in female fusiform, narrow, tapering posteriorly, about  $560\mu$  long and 240 broad; caudal bristles very long.”

*Habitat:* On *Acacia karroo*, Linn., Verulam, Natal (Fuller No. 5), and Pienaars River, Transvaal; collected by the writer, January 1917.

*Collection No.:* 72.

Subfamily ?

Genus **Halimococcus**, Ckll.

*Halimococcus*, Ckll., The Entom. xxxv, p. 15, 1902.

Only one species has yet been described *i.e.*, *H. lampus*, Ckll. Professor Cockerell's original descriptions of the genus and type species are as follows:—

“A Dactylopiine Coccid enclosed in a horny sac shaped like that of *Solenococcus*, without legs or antennae in the adult. Larva with no rows of dorsal spines, no hairs on anal ring, and no caudal tubercles, but four long caudal bristles as in *Phoenicococcus*. Closely related to *Phoenicococcus* (which lives in Algeria), but distinguished by the form of the sac, which exactly imitates that of *Solenococcus*.”



189. **Halimococcus lampas**, Ckll. (Plate ix, fig. 204 ; Plate xii, fig. 225).

*Halimococcus lampas*, Ckll., The Entom. xxxv, p. 15, 1902.

“ ♀. Enclosed in a dark brown horny sac (which is not dissolved by liquor potassae), which is shaped like a *Terebratula* shell, *i.e.*, oval, with the end raised and terminating in an orifice. Length of sac  $510\mu$ , breadth  $300\mu$ , breadth of orifice about  $66\mu$ . The orifice is closed by a reticulated plate, except basally, where there is a semilunar opening. In immature examples the sac is prominently segmented on the ventral side.

“ ♂. Scale small, cylindrical, horny, ferruginous, of the same texture as that of the female, but usually somewhat paler. Length  $350\mu$ , breadth 140. The end comes off, leaving a round opening, as in Muscid pupae.

“ ♀. A mere bag, with well-developed mouth and spiracles.

“ Larva. Rather narrow ; legs and antennae present. No caudal tubercles, but two pairs of long caudal bristles ; two small bristles close to these. Antennae about  $45\mu$  long, six-jointed, last joint much the longest. No dorsal spines. Last antennal joint with two long bristles. Femur remarkably stout, about  $15\mu$  broad ; length of femur + trochanter about  $30\mu$ .

“ Older specimens have actually shorter ( $36\mu$ ) antennae, with joint 6 longer than 4 + 5 ; 5 longer than 3, 3 longer than 4, 1 large.

“ A few white curled waxen threads protrude from beneath the sacs of the females.”

*Habitat* : On leaves of palm (*Hyphaene crinita*), Durban, Natal ; collected by C. Fuller about 1901.

*Collection No.* : 42.

#### Genus **Baccacoccus**, nov.

Allied to the LECANIINAE. Body of adult ♀, at maturity, naked, without test or waxy covering, almost globular, appearing like a berry on the twigs of the host-plant. In the type species the colour is yellow to orange, often with a faint metallic bronzy sheen, the whole insect simulating a *Margarodes* cyst. Antennae well-developed, 7-jointed. Legs well-developed, long, upper and lower digitules present, clubbed. Anal ring large, with numerous (16 ?) hairs. Stigmatic clefts, two on each side, with 4 or 5 broad conical protuberances supplied with glands.

Type, *B. elytropappi*, sp. n.

190. **Baccacoccus elytropappi**, sp.n. (Plate ix, fig. 207 ; Plate xii, fig. 226).

Adult female almost globular, to 3 mm. in diameter, yellow to brownish, glossy, like a *Margarodes* cyst, with the small brown anal plates occupying the position of the caudal pore of an *Asterolecanium* test. In the middle of the dorsum there is a prominence, like a minute keel, occasionally with two rounded prominences in close proximity but a little posterior to it. There is no fringe in the material at hand, but four short white bands, two on either side from the stigmatic clefts at the point where the insect is attached to the thin twig or leaf of the host-plant.

When cleared and mounted the derm is almost hyaline, appearing yellowish, with the antennae and legs of about the same density. The integument is without gland-pores and hairs except immediately around the anal plates (fig. 226, *d*). The

legs are long and slender, with long slender digitules, which bear spherical knobs. The lower digitules of the claw are stouter and shorter. The antennae are 7-segmented with joints 3 and 4 long, and almost equal. The stigmatic clefts are broad and shallow with 4 or 5 low conical glandular protuberances (fig. 226, c). The anal ring has numerous (10 to 12) long hairs and is closed above by two plates as illustrated in the figure.

*Habitat* : On thin twigs of rhenosterbosch (*Elytropappus rhinocerotis*, Less.), French Hoek, C. P. ; collected by C. P. Lounsbury, 1904.

*Collection No.* : 297.